

STATION #4 – PASSENGERS IN A BOAT

Materials: aluminum foil, pennies, water, and a large beaker or plastic shoebox

Directions:

1. Use the piece of aluminum foil to create a boat.
2. Measure the mass of your boat. Record the mass in the data table.
3. Fill your water container (a beaker or plastic shoebox) $\frac{2}{3}$ full of water. Place your boat on the water to see if it will float. If the boat does not float, reshape the boat until you can get it to float.
4. Make a sketch of your boat.
5. Measure the mass of one penny. Record the mass in the data table.
6. Estimate the maximum number of pennies that your boat will hold.
7. Add pennies to your boat one at a time until the boat sinks (be sure not to place all pennies in one location). Record the number of pennies the boat held before sinking.
8. Remove the pennies and the boat. Dry them.
9. Multiply the mass of one penny by the maximum number of pennies that will allow the boat to remain floating. Record this number in the data table.

Cleanup: Dry all materials. Clean up any water spills.

Lab # 4. Passengers in a Boat

Data:

Measurement	Boat 1	Boat 2	Boat 3	Boat 4	Boat 5
Number of pennies needed to sink boat					
Mass of empty boat					
Mass of boat and pennies					
Volume of boat					
Density of empty boat					
Density of boat with pennies					

Sketch:

Analysis:

1. What is buoyancy and how does it relate to this lab?
2. Does the mass of the boat affect the buoyancy? Why or why not?
3. How are the concepts of buoyancy and density used to design boats that will float on water?